

IN THE CLAIMS:

1. An environmentally safe composition for treating trees and tree derived products comprising:

at least one short chain polyalkylene glycol having an average molecular weight of between about 200 and 400;

at least one short chain alkylene glycol; and

a glycol soluble boron containing compound in an amount effective to prevent or eradicate infestation.

2. The composition of claim 1 wherein said at least one short chain polyalkylene glycol is polyethylene glycol and is present in an amount of between about 4% and about 23% by weight; said at least one short chain alkylene glycol is ethylene glycol and is present in amount of between about 27% and about 76% by weight and said glycol soluble boron containing compound is disodium octaborate tetrahydrate and is present in an amount of between about 20% and about 50% by weight.

3. The composition of claim 2 wherein said polyethylene glycol has an average molecular weight of about 200 and is present in an amount of between about 8% and 15% by weight, said ethylene glycol is present in an amount of between about 35% and about 62% by weight and said disodium octaborate tetrahydrate is present in an amount of between about 30% and about 50% by weight.

4. The composition of claim 3 wherein said polyethylene glycol is present in an amount of between about 10% and 13% by weight, said ethylene glycol is present in an amount of between about 45% and about 54% by weight and said disodium octaborate is present in an amount of between about 36% and about 45% by weight.

5. The composition of claim 4 wherein said polyethylene glycol is present in an amount of about 11.9% by weight, said thylene glycol is present in an

amount of about 47.5% by weight and said disodium octaborate tetrahydrate is present in an amount of about 40.6% by weight.

5 6. The composition of claim 1 further comprising water.

7. The composition of claim 6 wherein said water is present in an amount up to about 10 times the volume of the combination of said at least one short chain polyalkylene glycol, said at least one short chain alkylene glycol and said glycol soluble boron containing compound.

8. The composition of claim 7 wherein said water is present in an amount of between about 0.5 and about 5 times the combined volume of said other three ingredients.

9. The composition of claim 3 further comprising water.

10. The composition of claim 9, wherein said water is present in an amount of up to about 10 times the volume of the combination of said short claim polyethylene glycol, ethylene glycol, and said disodium octaborate tetrahydrate.

11. The composition of claim 10, wherein said water is present in an amount of between about 0.5 and about 5 times the combined volume of said other three ingredients.

12. The composition of claim 4, further comprising water.

13. The composition of claim 12, wherein said water is present in an amount of up to about 10 times the volume of the combination of said short claim polyethylene glycol, ethylene glycol, and said disodium octaborate tetrahydrate.

14. The composition of claim 13, wherein said water is present in an amount of between about 0.5 and about 5 times the combined volume of said other three ingredients.

15. The Composition of claim 14, wherein said water is present in an amount of between about 1 and about 4 times the combined volume of said other three ingredients.

5 16. The composition of claim 5, further comprising water.

10 17. The composition of claim 16, wherein said water is present in an amount of up to about 10 times the volume of the combination of said short claim polyethylene glycol, ethylene glycol, and said disodium octaborate tetrahydrate.

15 18. The composition of claim 17, wherein said water is present in an amount of between about 0.5 and about 5 times the combined volume of said other three ingredients.

19. The composition of claim 18, wherein said water is present in an amount of between about 1 and about 4 times the combined volume of said other three ingredients.

20 20. The composition of claim 19, wherein said polyethylene glycol is present in an amount of about 6.90% by weight, said ethylene glycol is present in an amount of about 27.54% by weight, said disodium octaborate tetrahydrate is present in an amount of
25 23.54% by weight, and said water is present in an amount of about 42.01% by weight, based on the total weight of the composition.

21. An environmentally safe composition for treating trees and tree derived products comprising:

30 a mixed glycol including at least one short chain polyalkylene glycol having an average molecular weight of between about 200 and about 400, and at least one short chain alkylene glycol; and

35 boron provided as a glycol soluble boron containing composition in an amount effective to prevent or eradicate infestation.

22. The composition of claim 21 wherein said boron and said mixed glycols are present in an amount

of between about 1 part boron to about 5 parts mixed glycol to about 1 part boron to about 20 parts mixed glycol, and said mixed glycol includes from about 1 part of said polyalkylene glycol to about 1 part of said alkylene glycol to about 1 part of said polyalkylene glycol to about 20 parts of said alkylene glycol.

23. The composition of claim 22 wherein said short chain polyalkylene glycol is polyethylene glycol, said short chain alkylene glycol is ethylene glycol, and said boron provided as a glycol soluble boron containing compound is selected from the group consisting of disodium octaborate tetrahydrate, borax, boric acid, potassium, ammonium, and sodium salts of boric acid, and boric oxide.

24. The composition of claim 23 wherein said polyethylen glycol has an average molecular weight of about 200 and said boron and said mixed glycols are present in an amount of between about 1 part boron to about 6.5 parts mixed glycol to about 1 part boron to about 10 parts mixed glycol.

25. The composition of claim 24 wherein the amount of said boron is about 1 part per 7.12 parts of said mixed glycol and the ratio of said polyethylene glycol and said ethylene glycol is about 1:4.

26. The composition of claim 24 wherein said glycol soluble boron containing compound is disodium octaborate tetrahydrate.

27. The composition of claim 21 further comprising water.

28. The composition of claim 27 wherein said water is provided in an amount of up to 85.5 parts per part of boron.

29. The composition of claim 23 further comprising water in an amount of up to about 85.5 parts per part of boron.

30. The composition of claim 26 further comprising water in an amount of between about 8.8

parts per part boron to about 85.5 parts per part boron.

31. The composition of claim 30 wherein said water is present in an amount of between and about 8.8 parts per part boron to about 34.2 parts per part boron.

32. A method for manufacturing an environmentally safe composition useful for preventing and eradicating infestation in a tree or tree derived product comprising the steps of

charging at least one short chain polyalkylene glycol having an average molecular weight of between about 200 and about 400 and at least one short chain alkylene glycol to a sealable vessel; agitating said glycols; adding to said glycols an amount of glycol soluble boron containing compound effective to prevent or eradicate infestation; agitating said glycols and said boron containing compound to produce a homogeneous mixture; elevating the temperature of said mixture to between about 160°F and 180°F; and filtering the resulting solution.

33. The method of claim 32 further comprising the step of heating said solution prior to the addition of said glycol soluble boron containing compound and during agitation.

34. The method of claim 32 wherein said short chain polyalkylene glycol having an average molecular weight of between about 200 and about 400 is a polyethylene glycol having an average molecular weight of about 200, said short chain alkylene glycol is ethylene glycol and said glycol soluble boron containing compound is selected from the group consisting of disodium octaborate tetrahydrate, borax, boric acid, potassium, ammonium, and sodium salts of boric acid, and boric oxide.

35. The method of claim 34 wherein said polyethylene glycol has an average molecular weight of about 200 and is present in an amount of between about

8 and 15% by weight, said ethylene glycol is present in an amount of between about 35% and about 62% by weight and said glycol soluble boron containing compound is disodium octaborate tetrahydrate and is present in an amount of between about 30% and about 50% by weight.

36. The method of claim 35 wherein said polyethylene glycol is present in an amount of between about 10% and about 13% by weight, said ethylene glycol is present in an amount of between about 45% and about 54% by weight and said disodium octaborate is present in an amount of between about 36% and about 45% by weight.

37. The method of claim 36 wherein said polyethylene glycol is present in an amount of about 11.9% by weight, said ethylene glycol is present in an amount of about 47.5% by weight said disodium octaborate tetrahydrate is present in an amount of about 40.6% by weight.

38. The method of claim 32 further comprising the step of adding a measured amount of water to said filtered mixture; and mixing said solution to provide uniformity and eliminate cloudiness therein.

39. The method of claim 38 including heating said water to a temperature of between about 60°F. and about 110°F.

40. The method of claim 38 wherein said short chain polyalkylene glycol having an average molecular weight of between about 200 and about 400 is polyethylene glycol having an average molecular weight of about 200 present in an amount of between about 8 and about 15% by weight, said alkylene glycol is ethylene glycol and is present in an amount of between about 35% and about 62% by weight, said glycol soluble boron containing compound is disodium octaborate tetrahydrate and is present in an amount of between about 30% and about 50%, and said water is present in

an amount of up to about 10 times the volume of the other three ingredients.

5 41. The method of claim 40 wherein said polyethylene glycol is present in an amount of between about 10% and about 13% by weight, said ethylene glycol is present in an amount of between about 45% and about 54% by weight, and said disodium octaborate tetrahydrate is present in an amount of between about 36% and about 45% by weight.

10 42. The method of claim 41 wherein said polyethylene glycol is present in an amount of about 11.9% by weight; said ethylene glycol is present in an amount of about 47.5% by weight, said disodium octaborate tetrahydrate is present in an amount of about 40.6% by weight and said water is present in an amount of between about 1 and about 4 times the volume of the combination of the other three ingredients.

15 43. A method of preventing or eradicating an infestation in a tree derived product comprising the steps of:

20 providing an environmentally safe composition comprising at least one short chain polyalkylene glycol having an average molecular weight of between about 200 and 400; at least one short chain alkylene glycol; and a glycol soluble boron containing compound in an amount effective to prevent or eradicate infestation;

25 diluting said composition with water in amount of between about 0.50 and about 10.0 times the volume of the combination of the other three ingredients;

30 mixing the resulting solution to provide uniformity and eliminate cloudiness; and applying said mixture to a surface of said tree derived product.

35 44. The method of claim 43 wherein said step of applying said mixture is accomplished by a process

selected from the group consisting of low pressure spraying, high pressure spraying, brushing, misting, immersion, injection, spreading, insertion, and pressure treatment.

5 45. The method of claim 44 wherein said environmentally safe composition comprises polyethylene glycol having an average molecular weight of about 200, ethylene glycol, and a glycol soluble boron containing
10 compound selected from the group consisting of disodium octaborate tetrahydrate, borax, boric acid, potassium, ammonium, and sodium salts of boric acid and boric oxide.

 46. The method of claim 45 wherein said polyethylene glycol is present in an amount of between
15 about 8 and 15% by weight of the undiluted composition, said ethylene glycol is present in an amount of between about 35% and about 62% by weight of the undiluted composition and said glycol soluble boron containing
20 compound is disodium octaborate tetrahydrate and is present in an amount of between about 30% and about 50% by weight of the undiluted composition.

 47. The method of claim 46 wherein said polyethylene glycol is present in an amount of between
25 and about 10% and about 13% by weight of the undiluted composition, said ethylene glycol is present in an amount of between about 45% and about 54% by weight of the undiluted composition, and said disodium octaborate tetrahydrate is present in an amount of between about
30 36% and 45% by weight of the undiluted composition.

 48. The method of claim 47 wherein said polyethylene glycol is present in an amount of about
30 11.9% by weight of the undiluted composition, said ethylene glycol is present in an amount of about 47.5% by weight of the undiluted composition and, said
35 disodium octaborate tetrahydrate is present in an amount of about 40.6% by weight of the undiluted composition.

49. The method of claim 44 wherein said water is present in an amount of from about 0.5 to about 5 times the volume of the three other ingredients.

5 50. The method of claim 49 wherein said water is present in an amount of between about 1 and about 4 times the volume of the other three ingredients.

10 51. A method of preventing or eradicating an infestation in a tree derived product comprising the steps of: providing an environmentally safe composition including a mixed glycol including at least one short chain polyalkylene glycol having an average molecular weight of between about 200 and about 400,
15 and at least one short chain alkylene glycol; and boron provided as a glycol soluble boron containing composition in an amount effective to prevent or erradicate infestation; diluting said composition with water in an amount of between about 1 part boron to about 8.8 parts water to about 1 part boron to about
20 85.5 parts water; mixing the resulting solution to provide uniformity and eliminate cloudiness; and applying said mixture to a surface of a tree derived product.

25 52. The method of claim 51 wherein said step of applying said mixture is accomplished by a process selected from the group consisting of low pressure spraying, high pressure spraying, brushing, misting, immersion, injection, spreading, insertion, and
30 pressure treatment.

35 53. The method of claim 52 wherein said short chain polyalkylene glycol having an average molecular weight of between about 200 and about 400 is polyethylene glycol having an average molecular weight of about 200, said alkylene glycol is ethylene glycol and said boron provided as a glycol soluble boron containing compound is selected from the group consisting of disodium octaborate tetrahydrate, borax,

boric acid, potassium, ammonium, and sodium salts of boric acid and boric oxide.

54. The composition of claim 53 wherein said boron and said mixed glycols are present in an amount of between about 1 part boron to about 5 parts mixed glycol to about 1 part boron to about 20 parts mixed glycol and said mixed glycols include from about 1 part of said polyethylene glycol to about 1 part of said alkylene ethylene glycol to about 1 part of said polyethylene glycol to about 20 parts of said ethylene glycol.

55. The method of claim 54 wherein said boron and said mixed glycols are present in an amount of between about 1 part boron to about 6.5 parts mixed glycol to about 1 part boron to about 10 parts mixed glycol and wherein said water is present in an amount of between about 8.8 parts per part boron to about 34.2 parts per part boron.

56. The method of claim 55 wherein said boron is present in an amount of about 1 part per 7.12 parts of said mixed glycol and the ratio of said polyethylene glycol and said ethylene glycol is about 1:4 and said water is present in an amount of about 8.8 parts water to about 1 part boron.

57. A method of treating a living tree to prevent or eradicate infestation comprising the steps of:
drilling a hole in the trunk of a tree to be treated;
inserting into said hole adaptive means for
accommodating the introduction of a solution; and
administering an environmentally safe composition comprising at least one short chain polyalkylene glycol having an average molecular weight of between about 200 and about 400; at least one short chain alkylene glycol; and a glycol soluble boron containing compound in an amount effective to prevent or eradicate infestation to said tree through said adaptive means.

58. The method of claim 57 further comprising the steps of removing said adaptive means from the trunk of said tree and patching said hole.

5 59. The method of claim 57 wherein said hole is approximately 0.25" to about 2.5" wide and approximately as deep as the radius of said tree.

10 60. The method of claim 57 wherein said short chain polyalkylene glycol having an average molecular weight of between about 200 and about 400 is polyethylene glycol and is present in an amount of between about 8% and 15% by weight, said short chain alkylene glycol is ethylene glycol and is present in an amount of between about 35% and about 62% by weight and said glycol soluble boron containing compound is
15 disodium octaborate tetrahydrate and is present in an amount of between about 30% and about 50% by weight.

20 61. The method of claim 60 wherein said polyethylene glycol has an average molecular weight of about 200, and is present in an amount of about 10% to about 13% by weight, said ethylene glycol is present in an amount of between about 45% and 54% by weight and said disodium octaborate tetrahydrate is present in an amount of between about 36% and about 45% by weight.

25 62. The method of claim 61 wherein said polyethylene glycol is present in an amount of about 11.9% by weight, said ethylene glycol is present in an amount of about 47.5% by weight said disodium octaborate tetrahydrate is present in an amount of about 40.6% by weight.

30 63. The method of claim 57 further comprising water in an amount of less than about 50% of the volume of the combination of the other three ingredients.

35 64. A tree treated in accordance with the method of claim 57.

65. A tree treated in accordance with the method of claim 61.

66. A tree treated in accordance with the method of claim 63.

5 67. A composition of matter comprising at least one short chain alkylene glycol, at least one glycol soluble boron containing composition and water in an amount of at least about 50% by weight based on the weight of the other two ingredients.

10 68. The composition of claim 67 wherein the ratio of said alkylene glycol to said boron containing composition is from about 10:1 to about 1.5:1.

15 69. The composition of claim 68 wherein said alkylene glycol is ethylene glycol and is present in an amount of about 60% by weight, based upon the undiluted weight of the composition, said boron containing composition is disodium octaborate tetrahydrate and is present in an amount of about 40% by weight based on the weight of the other two ingredients.

20 70. A composition of matter capable of providing protection against infestation and weathering comprising: a homogenous solution of at least one water emulsifiable polymer based weather sealant suitable for application to the surface of a tree derived product, in an amount of about 80% to about 90% by weight; and an environmentally safe composition for treating tree
25 derived products which includes at least one short chain polyalkylene glycol having an average molecular weight of between about 200 and 400, at least one short chain alkylene glycol, and a glycol soluble boron containing compound present in an amount effective to
30 prevent or eradicate infestation, wherein said environmentally safe composite is provided in an amount of between about 10% and 20% by weight.

35 71. The composition of claim 70 wherein said at least one short chain polyalkylene glycol is polyethylene glycol and is present in an amount of between about 4% and about 23% by weight; said at least one short chain alkylene glycol is ethylene glycol and is present in amount of between about 27 and about 76%

by weight and said glycol soluble boron containing compound is disodium octaborate tetrahydrate and is present in an amount of between about 20% and about 50% by weight.

5 72. The composition of claim 71 wherein said polyethylene glycol has an average molecular weight of about 200 and is present in an amount of between about 8% and 15% by weight, said ethylene glycol is present
10 in an amount of between about 35% and about 62% by weight and said disodium octaborate tetrahydrate is present in an amount of between about 30% and about 50% by weight.

15 73. The composition of claim 72 wherein said polyethylene glycol is present in an amount of between about 10% and 13% by weight, said ethylene glycol is present in an amount of between about 45% and about 54% by weight and said disodium octaborate is present in an amount of between about 36% and about 45% weight.

20 74. The composition of claim 73 wherein said polyethylene glycol is present in an amount of about 11.9% by weight, said ethylene glycol is present in an amount of about 47.5% by weight and said disodium octaborate tetrahydrate is present in an amount of about 40.6% by weight.

25 75. An environmentally safe composition for treating trees and tree derived products comprising: boron provided as glycerine soluble boron containing composition in an amount effective to prevent or eradicate infestation; and glycerine in an amount
30 effective to solubilize all of said boron.

 76. The composition of claim 75 wherein said glycerine is present in an amount of from about 5 to about 20 parts per part boron.

35 77. The composition of claim 76 wherein said boron provided as a glycerine soluble boron containing composition is selected from the group consisting of disodium octaborate tetrahydrate, borax, boric acid,

potassium, ammonium and sodium salts of boric acid and boric oxide.

5 78. The composition of claim 77 wherein said boron is disodium octaborate tetrahydrate provided in an amount of about 40.6% by weight with the balance being said glycerine.

 79. The composition of claim 75 further comprising water in an amount of up to about 85.5 parts per part of boron.

10 80. The composition of claim 78 further comprising water in an amount of up to about 85.5 parts per part of boron.

 81. The composition of claim 80 wherein said water is provided in an amount of between about 8.8 and about 34.2 part per part of boron.

15 82. An environmentally safe composition for treating trees and tree derived products comprising boron provided as a glycerine and glycol soluble boron containing compound; provided in an amount effective to prevent or eradicate infestation; and a mixture of glycerine and at least one short chain alkylene glycol, said mixture present in an amount effective to solubilize all of said boron.

20 83. The composition of claim 82 wherein said mixture of said glycerine and said glycol is present in an amount of from about 6.5 to about 10 parts per part boron.

25 84. The composition of claim 83 wherein the ratio of said glycol to said glycerine is from about 4:1 to about 1:4.

30 85. The composition of claim 84 wherein said glycol is ethylene glycol and said boron provided as a glycerine and glycol soluble boron containing compound is selected from the group consisting of disodium octaborate tetrahydrate, borax, boric acid, potassium, ammonium and sodium salts of boric acid, and boric oxide.

86. The composition of claim 85 wherein said boron provided as a glycerine and glycol soluble boron containing compound is disodium octaborate tetrahydrate present in an amount of about 40.6% by weight, said ethylene glycol is present in an amount of about 47.5% by weight and said glycerine is present in an amount of about 11.9% by weight.

87. The composition of claim 82 further comprising water in an amount of up to about 85.5 parts per part boron.

88. The composition of claim 86 further comprising water in an amount of up to about 85.5 parts per part boron.

89. The composition of claim 88 wherein said water is provided in an amount of between about 8.8 and about 34.2 parts per part of boron.

90. The composition of claim 86 diluted 1:1 with water.

91. A method of treating a live tree to prevent or eradicate infestation comprising the steps of: drilling a hole in the trunk of a tree to be treated; inserting into said hole adaptive means for accommodating the introduction of a solution; administering an environmental safe composition comprising boron provided as a glycerine soluble boron containing composition in an amount effective to prevent or eradicate infestation and glycerine in an amount effective to solubilize all of said boron.

92. The method of claim 91 wherein said glycerine is present in an amount of from about 5 to about 20 parts per part boron.

93. The method of claim 92 wherein said boron provided as a glycerine soluble boron containing composition is selected from a group consisting of disodium octaborate tetrahydrate borax, boric acid, potassium, ammonium and sodium salts of boric acid and boric oxide.

94. The method of claim 93 wherein said boron is disodium octaborate tetrahydrate provided in an amount of about 40.6% by weight with the balance being said glycerine.

5 95. A method of treating a living tree to prevent or eradicate infestation comprising the steps of: drilling a hole in the trunk of a tree to be treated; inserting into said hole adaptive means for
10 accommodating the introduction of a solution; and administering an environmentally safe composition comprising boron provided as a glycerine and glycol soluble boron containing compound; provided in an amount effective to prevent or eradicate infestation and a mixture of glycerine and at least one short chain
15 alyklyne glycol said mixture present in an amount effective to solubilize all of said boron.

96. The method of claim 95 wherein said mixture of said glycerine and said glycol are present in an amount of from about 6.5 to about 10 parts per
20 part boron.

97. The composition of claim 96 wherein the ratio of said glycol to said glycerine is from about 4:1 to about 1:4.

25 98. The method of claim 97 wherein said glycol is ethylene glycol and said boron provided as a glycerine and glycol soluble boron containing compound is selected from the group consisting of disodium octaborate tetrahydrate, borax, boric acid, potassium, ammonium and sodium salts of boric acid, and boric
30 oxide.

99. The method of claim 98 wherein said boron provided as a glycerine and glycol soluble boron containing compound is disodium octaborate tetrahydrate present in an amount of about 40.6% by weight, said
35 ethylene glycol is present in an amount of about 47.5% by weight and said glycerine is present in an amount of about 11.9% by weight.